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THE SMALL PATENT LAW GROUP LLP
611 OLIVE STREET, SUITE1611
ST. LOUIS, MO 63101

EXAMINER	
RICE, ELISA M	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/533,804	LINNENKOHL ET AL.	
	Examiner	Art Unit	
	ELISA M. RICE	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *2/19/2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant's amendments filed on February 19, 2008 have been received and will be entered. Claims 1-23 are currently pending.

Response to Arguments

Applicant's arguments with respect to claim 1, 13, and 18 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

Objections to claims 5, 14, and 19 under 37 CFR 1.75(a), are withdrawn in light of the amendments made by the Applicant.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4, 10, and 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Renault (FR 2741438) and Caspi (5,774,572).

Regarding claim 1, Renault discloses a device for detecting a structure, to be applied to a substrate, comprising: an illumination module (Fig. 1, num. 6), a sensor unit (Fig. 1, num. 7), the sensor unit being provided on a device that applies the structure (Fig. 1, num. 6) to the substrate (Fig. 1, num. 5), the sensor unit obtaining an image of an area of the substrate ("at least a camera to record the images of the cord during the operation of the deposit", paragraph 9 of page 1); and an analytical unit placing a set of calipers over a set of data determined from the image, whereby the calipers extend at a non-parallel angle to a track upon the substrate ("Let us consider the treated image number N (see Fig. 4). The points An and Bn are provided by the phase of training as described above, then the orthogonal successive Pj profiles with the segment [An, Bn] are positioned.", paragraph 9 on page 3), the image illustrating structure through a brightness profile of gray values along the calipers, the analytic unit performing structure determination according to at least one of the following criteria: according to width of structure ("By considering the various levels of gray on the Pj segment, the edge B2 corresponds to a rising face and the edge B2i +1 with a downward face of a signal representative of the levels of gray. On each Pj profile, two rising faces and two downward faces are given. Detected cord 3 corresponds to the pairing of a rising face and a downward face. The diameter of the cord is then defined as being the distance between the two faces.", paragraph 11 on page 3) .

Renault does not teach wherein structure determination is based on a second derivative of the brightness profile of gray values.

Caspi teaches wherein structure determination is based on a second derivative of the brightness profile of gray values (Caspi, column 3, lines 8-12).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Renault reference to include structure or edge determination based on a second derivative of the brightness profile of gray values as taught by Caspi because using the second derivative of the brightness profile of gray values "produces a binary bit map of the object at a resolution greater than the resolution of the grey scale image" (Caspi, column 3, lines 15-18) which is helpful for "acquiring data faster than conventional automatic visual inspection systems, and/or reducing the amount of illumination required for the board, and increasing the depth of field" (Caspi, column 2, lines 51-54)

Regarding claim 2, the combination of Renault and Caspi discloses the device according to claim 1, wherein the sensor unit is positioned directly at the exit of the facility for the application of the structure (see Fig. 1, "Camera 7 and the means of lighting 6 preferably appreciably coaxial and are directed towards cord 3, and are fixed on the body of tube 2 near the end of this one, via a common support 10. Thus it is possible not only to obtain a precise image and of big size of cord 3, but also an image

deprived of parasitic vibrations, since the movements of camera 7 and tube 2 are coordinated.", paragraph 7 on page 2).

Regarding claim 3, the combination of Renault and Caspi discloses the device according to claim 1 wherein the sensor unit comprises a video-sensor which records one and/or several picture lines (Fig. 1, num. 7).

Regarding claim 4, the combination of Renault and Caspi discloses the device according to claim 1 wherein the illumination module contains a white light illumination module ("the means of lighting comprise a lighting in halogenous light", paragraph 10 on page 1). Halogen lighting is a white light source.

Regarding claim 10, the combination of Renault and Caspi discloses the device according to claim 1 wherein the analytical unit performs the structure determination, in addition, according to at least one of the following criteria: d. Co-linearity of the actual position; f. Co-linearity of the actual width of the structure; h. Co-linearity of the actual brightness of the structure; and j. Co-linearity of the actual brightness of the background. Renault uses the criteria of co-linearity of the actual brightness of the structure and the co-linearity of the actual brightness of the background to determine the edge as shown in the following statement made in page 3 in paragraph 11: "By considering the levels of gray on the Pj segment, the edge…corresponds to a rising face and the edge….with a downward face of a signal representative of the levels of

gray. On each Pj profile, two rising faces and two downward faces are given. Detected cord 3 corresponds to the pairing of a rising face and a downward face. The diameter of the cord is then defined as being the distance between the two faces."

Regarding claim 13, Renault discloses a method for the detection of a structure applied to a substrate, comprising: a) providing an illumination module (Fig. 1, num. 6) and a sensor unit (Fig. 1, num. 7) on the device that applies (Fig. 1, num. 2) the structure (Fig.1, num. 3) to the substrate (Fig. 1, num. 5); b) determining the structure during the application of the structure to the substrate ("it gives uninterrupted the diameters and the positions of cord 3 during each operation of deposit", paragraph 8 of page 3), whereby the structure determination is performed by means of calipers, which extend non-parallel to a track of the substrate and structure (Fig. 4; "The points An and Bn are provided by the phase of training as described above, then the orthogonal successive Pj profiles with the segment [An, Bn] are positioned.", paragraph 9 on page 3), the structure being determined by means of the brightness); and displaying a profile of the structure (Fig. 1, num. 9), and corresponding error areas ("sight of the defects raised on the screen", paragraph 12 of page 2; "publish a report/ratio of control in the event of detection of a defect to give the dimensional specifications in particular of them.", paragraph 14 of page 3); whereby the structure determination is performed by means of the analysis of the brightness profile of the gray values along the caliper according to at least one of the following criteria: a. Level of edge contrast b. Width of structure c. Difference between set vs actual position e. Difference between set vs

actual width of the structure g. Difference between set vs actual brightness of the structure i. Difference between set vs actual brightness of the background. The width of the structure is used in structure determination by means of the brightness profile of the gray values along the calipers as illustrated in the following third paragraph of page 2: "To determine the diameter of the current cord (structure), one determines its transverse limits using levels of gray, the passage on the cord corresponding to a rising face of a signal representative of the level of gray, and the passage to leave the cord corresponding to a downward face of the signal representative of the level of ray, the current diameter of the cord being consisted the distance between the face going up and the downward face."

Renault does not teach wherein structure determination is performed by means of the analysis of a second derivative of the brightness profile of the gray values.

Caspi teaches wherein structure determination is performed by means of the analysis of a second derivative of the brightness profile of the gray values.
(Caspi, column 3, lines 8-12).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Renault reference to include wherein structure or edge determination is performed by means of the analysis of a second derivative of the brightness profile of the gray values.as taught by Caspi because using the second

derivative of the brightness profile of gray values “produces a binary bit map of the object at a resolution greater than the resolution of the grey scale image” (Caspi, column 3, lines 15-18) which is helpful for “acquiring data faster than conventional automatic visual inspection systems, and/or reducing the amount of illumination required for the board, and increasing the depth of field" (Caspi, column 2, lines 51-54)

Regarding claim 14, the combination of Renault and Caspi discloses the method according to claim 13, whereby the structure determination is performed with at least one illumination module being a white light module (“the means of lighting comprise a lighting in halogenous light”, paragraph 10 on page 1). Halogen lighting is a white light source.

Regarding claim 15, the combination of Renault and Caspi discloses the method according to any one of the claim 13, whereby substrate data are used for structure determination and corresponding error analysis. Renault uses the criteria of the co-linearity of the actual brightness of the background (the substrate) to determine the edge as shown in the following statement made in page 3 in paragraph 11: “By considering the levels of gray on the Pj segment, the edge…corresponds to a rising face and the edge….with a downward face of a signal representative of the levels of gray. On each Pj profile, two rising faces and two downward faces are given. Detected

cord 3 corresponds to the pairing of a rising face and a downward face. The diameter of the cord is then defined as being the distance between the two faces."

Regarding claim 16, the combination of Renault and Caspi discloses the method according to claim 13, whereby different error areas can be displayed separately by the visualization software ("According to the invention, the means of analysis 8 comprise means of memory 11 (Fig. 2) to safeguard the images of the defects of cord 3 which are localized during the deposit. These means of memory 11 being organized to allow the analysis of the image," Renault, paragraph 9 of page 2, "The memorized images are visualized either simultaneously, or later on with the realization of cord 3.....At the end of the cycle, it is possible to visualize the image number N again.", Renault, paragraph 15 of page 2)

Regarding claim 17, the combination of Renault and Caspi discloses the method according to claim 13, whereby the structure determination, in addition, is performed according to at least one of the following criteria: d. Co-linearity of the actual position f. Co-linearity of the actual width of the structure h. Co-linearity of the actual brightness of the structure j. Co-linearity of the actual brightness of the background. Renault uses the criteria of co-linearity of the actual brightness of the structure and the co-linearity of the actual brightness of the background to determine the edge as shown in the following statement made in page 3 in paragraph 11: "By considering the levels of gray on the Pj

segment, the edge…corresponds to a rising face and the edge….with a downward face of a signal representative of the levels of gray. On each Pj profile, two rising faces and two downward faces are given. Detected cord 3 corresponds to the pairing of a rising face and a downward face. The diameter of the cord is then defined as being the distance between the two faces."

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Renault (FR 2741438) and Caspi (5,774,572) as applied to claim 1, in view of Konagaya (US 6985217).

Regarding claim 5, while the combination of Renault and Caspi discloses the device according to claim 1, the combination of Renault and Caspi does not disclose wherein the illumination module is an LED illumination module radiating the spectral ranges, red, blue, green, infrared or ultra-violet.

Konagaya teaches wherein the illumination module is an LED illumination module radiating infrared (column 1, line 20-40).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of the combination of Renault and Caspi to include infrared light as taught by Konagaya because as Konagaya states in column 1, lines 20-

40, “the infrared rays are also used for detecting positions of the dust, the scratch and so forth.”

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Renault (FR 2741438) and Caspi (5,774,572) as applied to claim 1, and Edwards et al. (US 4704603).

Regarding claim 6, while the combination of Renault and Caspi discloses the device according to claim 1, the combination of Renault and Caspi does not further disclose comprising multiple illumination modules.

Edwards teaches a glue detection system further comprising multiple illumination modules (Edwards, Fig. 2; column 1, lines 23-59).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of the combination of Renault and Caspi to include multiple illumination modules as taught by Edwards because as is stated in column 1, between lines 23 to 59 “discrimination of specular from diffuse reflection of light” can “be the principle by which the sensor detects the presence of glue on the surface of the boards.”

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Renault (FR 2741438) and Caspi (5,774,572) as applied to claim 1, further in view of Shepard (US 6751342) and Thompson (US 2002/0122583).

Regarding claim 7, while the combination of Renault and Caspi discloses the device according to claim 1, the combination of Renault and Caspi does not further disclose wherein the analytical unit is provided within the sensor unit and the quality criteria are set by means of an external control unit.

Shepard teaches wherein the analytical unit is provided within the sensor unit (column 8, lines 6-20).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of the combination of Renault and Caspi to incorporate the analytical unit into the senor unit as taught by Shephard in order to "greatly reduce the data volume and manipulation normally associated" (Shephard, column 8, lines 10-11).

The combination of Renault, Caspi, and Shephard does not disclose whereby the quality criteria are set by means of an external control unit.

Thompson teaches a device whereby quality criteria are set by means of an external control unit (Thompson, paragraph 36).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of the combination of Renault, Caspi, and Shephard to set the quality criteria by means of an external control unit as taught by Thompson in order to provide “innstruction on how to accomplish a job at hand, diagnostic information and/or support information may also be transmitted to and from the maintenance apparatus” (Thompson, paragraph 36).

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Renault (FR 2741438) and Caspi (5,774,572) as applied to claim 1, and Goodman (US 4731931).

Regarding claim 8, while the combination of Renault and Caspi discloses the device according to claim 1 the combination of Renault and Caspi does not disclose wherein the analytical unit generates a set of hypotheses for each caliper.

Goodman discloses wherein a set of hypothesis for each caliper is generated. These include edge-to-edge, point-to-point, hole-to-hole, and edge-to-hole (abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of the combination of Renault and Caspi to include generating a

set of hypotheses for each caliper. in order to "accurately provide hole-to-hole measurements and edge-to-hole measurements, directly, without calculations or interpretations"

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Renault (FR 2741438), Caspi (5,774,572) and Goodman (US 4731931) as applied to claim 8, further in view of Engel et al. (US 5371690).

Regarding claim 9, while the combination of the invention of the combination of Renault, Caspi, and Goodman disclose the device according to claim 8, the combination of the invention of the combination of Renault, Caspi, and Goodman does not disclose wherein the analytical unit links neighboring sets of hypotheses.

Engel teaches wherein the analytical unit links neighboring sets of hypotheses (Engel, column 7, lines 29-46).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of the combination of Renault, Caspi, and Goodman to include a method wherein the analytical unit links neighboring sets of hypotheses as taught by Engel as stated in column 7 between lines 30-36, "by applying multiple calipers along the length of an edge (or edge pair) it is possible to determine angle, straightness, and continuity."

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Renault (FR 2741438) and Caspi (5,774,572) as applied to claim 1, further in view of Fazzio et al. (US 6825856).

Regarding claim 11, while the combination of Renault and Caspi discloses the device according to claim 1, the combination of Renault and Caspi does not further disclose comprising a three-dimensional display made possible by means of the position of the sensor unit and the structure determination.

Fazzio teaches a device comprising a three-dimensional display made possible by means of the position of the sensor unit and the structure determination (Fazzio, column 3, line 60-column 4, line 23).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of the combination of Renault and Caspi to include a three-dimensional display as taught by Fazzio in order to provide “a multidimensional depiction of an object to be inspected on a display screen” as stated by Fazzio in column 4, lines 3-4. “The multidimensional dimensional depiction on the display screen can be visually morphed to depict maximum and minimum tolerances. The user can select and set maximum and minimum tolerances, settings, thresholds, dimensions, etc. on the multidimensional image” (Fazzio, column 4, lines 3-9). More specifically, by

"viewing a three dimensional depiction of" the structure and "then morphing the depiction of the" structure one can "establish maximum and minimum acceptable limits for such" structure "being viewed and tested in a classification /manufacturing test apparatus." (Fazzio, column 1, lines 14-23).

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Renault (FR 2741438) and Caspi (5,774,572) as applied to claim 1, and further in view of Thompson (US 2002/0122583).

Regarding claim 12, while the combination of Renault and Caspi discloses a device according to claim 1, the combination of Renault and Caspi does not disclose further comprising a network connection that provides triggering and analysis over one of the Internet or Intranet.

Thompson teaches an inspection system comprising a network connection that provides triggering and analysis over the Internet (Thompson, paragraph 26 and 36).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of the combination of Renault and Caspi by including a network connection that provides triggering and analysis over the Internet as taught by Thompson so that it can be "used by maintenance personnel to capture images of the

equipment or objects they are inspecting or maintaining as well as enter notes or detailed descriptions in writing" as stated in paragraph 26 of the Thompson reference.

Claims 18, 21, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Renault (FR 2741438), Caspi (5,774,572) and McKendrick (US 5208995).

Regarding claim 18, Renault discloses a method for the detection of an adhesive extrusion line applied comprising: a) Obtaining an image showing the structure to be detected ("The training will consist in giving on each image the position of cord 3 symbolized by median 13 of the cord", paragraph 4 of page 3); b) Placing support points along the structure to be detected ("The points An and Bn are provided by the phase of training as described above," paragraph 9 of page 3); c) Connecting the support points to generate a reference line ("On the following image, i.e. the image number n +1, the points An +1 and Bn +1 will be deduced from the An points and Bn precedents by a mechanism of continuation gradually.", paragraph 6 of page 3); whereby, in addition, an inspection area along the reference line is defined ("One indicates by C1 and C2 circles centered on the tube 2, on which one seeks the presence of the cord of adhesive 3. One indicates per An and Bn points of intersection of the median segment 13 of the cord with the circles C1 and C2", paragraph 5 of page 3); d) Defining a range of tolerance ("Defects of position of the adhesive compared to sheet, in particular at the beginning of deposit, and compared to a deposit of reference. Variations of diameter of

the cord of adhesive of a percentage determined in more or less, for example 5%, compared to the diameter of a deposit of reference.", paragraph 8 of page 1); e) Determining whether or not the structure is within the range of tolerance ("to compare in an automatic way the position and the diameter currents with the corresponding values of reference, and the result, to indicate if the position and the diameter of the current cord are acceptable.", paragraph 2 of page 2); and placing a set of calipers over a set of data in the image ("Let us consider the treated image number N (see Figure 4). The points An and Bn are provided by the phase of training as described above, then the orthogonal successive Pj profiles with the segment [An, Bn] are positioned.", paragraph 9 on page 3), the structure being determined by means of the brightness profile of the gray values along the calipers ("By considering the various levels of gray on the Pj segment, the edge B2 corresponds to a rising face and the edge B2i +1 with a downward face of a signal representative of the levels of gray. On each Pj profile, two rising faces and two downward faces are given. Detected cord 3 corresponds to the pairing of a rising face and a downward face. The diameter of the cord is then defined as being the distance between the two faces." ,paragraph 11 on page 3) .

While Renault clearly defines a range of tolerance, Renault's Figure 4 does not explicitly show the "range of tolerance along the reference line."

McKendrick very explicitly teaches defining a range of tolerance along a reference line (McKendrick, column 6, lines 22-28).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Renault to define a range of tolerances along the reference line as taught by McKendrick so as to "compare with the reference standard corresponding to an ideal part in order to determine whether unacceptable variation in these features has occurred" as stated in the McKendrick reference in column 1, lines 22 to 25.

The combination of Renault and McKendrick does not teach wherein the structure being determined by means of a second derivative of the brightness profile of the gray values.

Caspi teaches wherein the structure being determined by means of a second derivative of the brightness profile of the gray values (Caspi, column 3, lines 8-12).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination of Renault and McKendrick to include structure or edge determination by means of a second derivative of the brightness profile of the gray values as taught by Caspi because using the second derivative of the brightness profile of gray values "produces a binary bit map of the object at a resolution greater than the resolution of the grey scale image" (Caspi, column 3, lines 15-18) which is helpful for "acquiring data faster than conventional automatic visual inspection systems, and/or

reducing the amount of illumination required for the board, and increasing the depth of field" (Caspi, column 2, lines 51-54)

Regarding claim 21, the combination of Renault, Caspi, and McKendrick discloses the method according to claim 18, whereby the structure determination, is performed according to at least one of the following criteria: a. Co-linearity of the actual position, b. Co-linearity of the actual width of the structure, c. Co-linearity of the actual brightness of the structure, d. Co-linearity of the actual brightness of the background. Renault uses the criteria of co-linearity of the actual brightness of the structure and the co-linearity of the actual brightness of the background to determine the edge as shown in the following statement made on page 3 in paragraph 11: “By considering the levels of gray on the Pj segment, the edge…corresponds to a rising face and the edge….with a downward face of a signal representative of the levels of gray. On each Pj profile, two rising faces and two downward faces are given. Detected cord 3 corresponds to the pairing of a rising face and a downward face. The diameter of the cord is then defined as being the distance between the two faces.”

Regarding claim 23, the combination of Renault, Caspi, and McKendrick discloses the method of claim 18, wherein the structure determination is performed according to at least one of the following criteria: a. Level of edge contrast; b. Width of structure; c.

Difference between set vs actual position; d. Difference between set vs actual width of the structure; e. Difference between set vs actual brightness of the structure; and f. Difference between set vs actual brightness of the background. ("By considering the various levels of gray on the Pj segment, the edge B2 corresponds to a rising face and the edge B2i +1 with a downward face of a signal representative of the levels of gray. On each Pj profile, two rising faces and two downward faces are given. Detected cord 3 corresponds to the pairing of a rising face and a downward face. The diameter of the cord is then defined as being the distance between the two faces.", paragraph 11 on page 3)

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Renault (FR 2741438) , Caspi (5,774,572) and McKendrick (US 5208995) as applied to claim 18, further in view of Goodman (US 4731931).

Regarding claim 19, while the combination of Renault, Caspi, and McKendrick discloses the method according to claim 18, the combination of Renault, Caspi, and McKendrick does not further disclose a method wherein a set of hypotheses is generated for each caliper.

Goodman teaches wherein a set of hypothesis for each caliper is generated. These include edge-to-edge, point-to-point, hole-to-hole, and edge-to-hole (abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of the combination of Renault, Caspi, and McKendrick to include generating a set of hypotheses for each caliper in order to "accurately provide hole-to-hole measurements and edge-to-hole measurements, directly, without calculations or interpretations" as stated in the Goodman reference in column 1, lines 41 to 47.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Renault (FR 2741438) , Caspi (5,774,572), McKendrick (US 5208995) and Goodman (US 4731931) as applied to claim 19, further in view of Engel (US 5,371,690).

Regarding claim 20, while the combination of Renault, Caspi, McKendrick and Goodman disclose the method according to claim 19, the combination of Renault, Caspi, McKendrick and Goodman do not disclose wherein neighboring sets of hypotheses are linked.

Engel teaches a method wherein neighboring sets of hypotheses are linked (Engel, column 7, lines 29-46).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of the combination of Renault, Caspi, McKendrick and Goodman to include a method wherein neighboring sets of hypotheses are linked as taught by Engel because as stated in column 7 between lines 30-36 of the Engel reference "by

applying multiple calipers along the length of an edge (or edge pair) it is possible to determine angle, straightness, and continuity."

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Renault (FR 2741438) , Caspi (5,774,572), and McKendrick (US 5208995) as applied to claim 18, and further in view of Goodman (US 4731931) and Engel (US 5,371,690).

Regarding claim 22, while the combination of Renault, Caspi, and McKendrick disclose the method of claim 18, the combination of Renault, Caspi, and McKendrick does not disclose further comprising generating a set of hypotheses for the calipers, and linking neighboring sets of hypotheses.

Goodman teaches wherein a set of hypotheses for each caliper is generated. These include edge-to-edge, point-to-point, hole-to-hole, and edge-to-hole (abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of the combination of Renault, Caspi, and McKendrick to include generating a set of hypotheses for each caliper in order to "accurately provide hole-to-hole measurements and edge-to-hole measurements, directly, without calculations or interpretations" as stated in the Goodman reference in column 1, lines 41 to 47.

The combination of Renault, Caspi, McKendrick , and Goodman does not disclose linking neighboring sets of hypotheses.

Engel teaches a method linking neighboring sets of hypotheses (Engel, column 7, lines 29-46).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of the combination of Renault, Caspi, McKendrick, and Goodman to include a method linking neighboring sets of hypotheses as taught by Engel because as stated in column 7 between lines 30-36 of the Engel reference “by applying multiple calipers along the length of an edge (or edge pair) it is possible to determine angle, straightness, and continuity.”

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ELISA M. RICE whose telephone number is (571)270-1582. The examiner can normally be reached on 8:00a.m.-5:30p.m. EST Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian P. Werner can be reached on (571)272-7401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Elisa M Rice/
Examiner, Art Unit 2624

/Brian P. Werner/
Supervisory Patent Examiner, Art Unit 2624